

What Is Claimed Is:

1. A device for filtering blood flowing through the ostium of an atrial appendage, comprising:  
a membrane tube having at least a first closed end wherein said first closed end comprises a blood-permeable filter; and

an expandable structure disposed in said tube, said structure having a collapsed configuration and an expanded configuration,

wherein said device is insertable in said appendage while said expandable structure is in said collapsed configuration, and wherein when said expandable structure is in said expanded configuration said closed end covers the ostium of said atrial appendage and portions of said membrane tube are pressed outwards against the interior walls of said atrial appendage anchoring said device therein.

2. The device of claim 1 wherein said membrane tube has a substantially cylindrical shape.

3. The device of claim 1 wherein said membrane tube has a second closed end.

4. The device of claim 3 wherein said second closed end comprises a blood-permeable filter.

5. The device of claim 1 wherein said expandable structure is self-expanding.

6. The device of claim 1 wherein said expandable structure expands from said collapsed

configuration to said expanded configuration by means of an inflatable balloon.

7. The device of claim 6 wherein said first closed end further comprises a self-sealing opening for withdrawing said inflatable balloon.

8. The device of claim 7 wherein said self-sealing opening comprises an elastic ring.

9. The device of claim 7 wherein said self-sealing opening comprises overlapping membrane flaps.

10. The device of claim 1 wherein said membrane tube comprises elastomeric material.

11. The device of claim 1 wherein said membrane tube comprises braided material.

12. The device of claim 1 wherein said membrane tube comprises woven material.

13. A method for filtering blood flowing through the ostium of an atrial appendage, comprising:

providing a device comprising a membrane tube having at least a first closed end wherein said first closed end comprises a blood-permeable filter;

inserting said device in said appendage;

positioning said closed end to cover said ostium; and

anchoring said device in said atrial appendage.

14. The method of claim 13 wherein said anchoring comprises pressing sides of said tube outward against the interior walls of said atrial appendage.

15. The method of claim 13 wherein said providing a device further comprises disposing an expandable structure in said membrane tube, wherein said inserting further comprises placing said device in said atrial appendage while said expandable structure is in a collapsed configuration, and wherein said positioning and said anchoring comprise expanding said expandable structure to an expanded configuration.

16. The method of claim 15 wherein said expanding comprises using an inflatable balloon.

17. The method of claim 16 further comprising deflating and withdrawing said balloon from said atrial appendage after said device is anchored in said atrial appendage.

18. A device for filtering blood flowing through the ostium of an atrial appendage, comprising:  
a cover comprising:

a filter element having a predetermined size; and

an expandable membrane attached to said filter element; and

an expandable structure for deploying said

cover,

wherein said expandable membrane stretches as said cover is deployed and allows said predetermined size to remain substantially unchanged.

19. The device of claim 18 wherein said filter element comprises holes substantially impervious to harmful-size emboli.

20. The filter of claim 18 wherein said filter element is made of material which is less elastic than said expandable membrane

21. A method for filtering blood flowing through the ostium of an atrial appendage, comprising:  
providing a cover comprising an expandable membrane attached to a filter element having a predetermined size;

providing an expandable structure to deploy said cover across said ostium; and

positioning said cover across said ostium using said expandable structure,

wherein said positioning comprises stretching said expandable membrane such that said predetermined size is substantially unchanged.

22. A device for filtering blood flowing through the ostium of an atrial appendage, comprising:

an expandable structure for covering said ostium; and

anchors disposed on the outer periphery of said expandable, wherein expandable structure has an axial length less than about the combined lengths of said ostium and a neck region of said atrial appendage leading to said ostium, wherein said expandable structure comprises a blood-permeable filter, and wherein said anchors engage surrounding ostium wall tissue.

23. The device of claim 22 wherein said expandable structure is self-expanding.

24. The device of claim 22 wherein said expandable structure expands in response to externally-initiated means.

25. The device of claim 24 wherein said externally-initiated means comprises an inflatable balloon.

26. The device of claim 22 wherein said blood-permeable filter comprises holes that are substantially impervious to harmful-size emboli.

27. A method for filtering blood flowing through the ostium of an atrial appendage, comprising:  
    providing an expandable structure comprising a blood-permeable filter, said expandable structure having an axial length less than about the length of an ostium;  
    providing anchors attached to said expandable structure;  
    disposing said expandable structure within said ostium;  
    positioning said expandable structure to cover said ostium; and  
    expanding said expandable structure so that said anchors engage surrounding ostium wall tissue.

28. The method of claim 27 wherein said providing an expandable structure comprises providing a self-expanding structure.

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29. The method of claim 27 wherein said providing an expandable structure further comprises providing externally-initiated means to expand said expandable structure, and wherein said expanding comprises initiating said means.

30. The method of claim 29 wherein said providing externally-initiated means comprises providing an inflatable balloon, and wherein said initiating comprises inflating said inflatable balloon.

31. The method of claim 30 further comprising deflating and withdrawing said inflatable balloon after said anchors engage surrounding ostium wall tissue.

32. The method of claim 27 wherein said positioning said expandable structure to cover said ostium comprises positioning said expandable structure to direct substantially all blood flow through said ostium to pass through said filter.

33. A device for filtering blood flowing through the ostium of an atrial appendage, comprising:  
a first structure comprising a blood-permeable filter element; and

a second structure attached to said first structure, said rear structure comprising at least one inflatable anchor set,

wherein said first structure is deployed across said ostium, and wherein said inflatable anchor set when inflated engages interior wall tissue of said atrial appendage to secure said device in its deployed position.

34. The device of claim 33 wherein said second structure comprises an axial portion, wherein said at least one inflatable anchor set comprises anchors attached to said axial portion along a radial circumference thereof.

35. The device of claim 33 wherein said second structure comprises an axial portion, wherein said at least one inflatable anchor set comprises anchors attached to said axial portion along an axial length thereof.

36. The device of claim 33 wherein said first structure comprises an inflatable structure.

37. The device of claim 33 wherein said filter element comprises holes substantially impervious to harmful-size emboli.

38. A method for filtering blood flowing through the ostium of an atrial appendage, comprising:

providing a device comprising:

a first structure comprising a blood-permeable filter element; and  
a second structure attached to said first structure, said second structure comprising at least one inflatable anchor set;

positioning said first structure to cover said ostium;

disposing said second structure interior to said atrial appendage; and

inflating said anchor set expanding so that said anchors engage surrounding atrial appendage wall tissue.

39. The method of claim 38 wherein providing an implant device further comprises providing said first structure comprising an inflatable structure.

40. A device for filtering blood flowing through the ostium of an atrial appendage, comprising:  
an expandable structure comprising:

a first portion having a blood-permeable filter element; and

a second portion having a cylindrical shape; and

anchors disposed on at least part of the exterior surface of said second portion,

wherein when said device is deployed in about the vicinity of said ostium by expanding said expandable structure said first portion covers said ostium to direct said blood flow through said filter element and said anchors engage surrounding wall tissue.

41. The device of claim 40 wherein said filter element comprises holes substantially impervious to filter harmful-size emboli.

42. The device of claim 40 wherein said second portion further comprises a substantially constant diameter cylindrical structure.

43. The device of claim 40 wherein said second portion further comprises a flared-diameter cylindrical structure.

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44. The device of claim 40 wherein said expandable structure is self-expanding.

45. The device of claim 40 wherein said expandable structure is balloon-expandable.

46. The device of claim 40 wherein said expandable structure has elastic deformation properties causing said expandable structure to recoil in size from its expanded size.

47. The device of claim 46 wherein said recoil in size causes said anchors that have engaged surrounding wall tissue to pull back and draw said walls closer to said device.

48. A method for filtering blood flow through the ostium of an atrial appendage, comprising:

providing a device comprising:

an expandable structure, said expandable structure comprising:

a first portion having a blood-permeable filter element; and

a second portion having a cylindrical shape; and

anchors disposed on at least part of the exterior surface of said second portion;

and

deploying said device in about the vicinity of said ostium wherein said deploying comprises:

positioning said first portion to cover said ostium; and

expanding said expandable structure so that said anchors engage surrounding wall tissue.

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49. The method of claim 48 wherein said providing a device further comprises providing said expandable structure which recoils in size from its expanded size, and wherein said expanding further comprises expanding and recoiling said expandable structure so that said anchors engage surrounding wall tissue and pull back drawing said walls toward said device.

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